

We claim:

- 1 1. A method of signal transmission comprising the steps of:
2 splitting a signal s_1 into signals $s_1(a)$ and $s_1(b)$, wherein signal s_1 comprises a first
3 STS/OTD signal belonging to an STS/OTD pair;
4 phase sweeping the signal $s_1(b)$ using a first phase sweep frequency signal to
5 produce a phase swept signal $s_1(b)$; and
6 adding the phase swept signal $s_1(b)$ to a signal s_2 to produce a summed signal s_3 ,
7 wherein the signal s_2 comprises a second STS/OTD signal belonging to the STS/OTD
8 pair.
- 1 2. The method of claim 1, wherein the signal s_1 is split unevenly such that the signal $s_1(a)$
2 has an associated power level greater than a power level associated with the signal $s_1(b)$.
- 1 3. The method of claim 1 comprising the additional steps of:
2 amplifying the signal $s_1(a)$ to produce an amplified signal $s_1(a)$; and
3 amplifying the signal s_3 to produce an amplified signal s_3 .
- 1 4. The method of claim 3, wherein power levels associated with the amplified signal $s_1(a)$
2 and the amplified signal s_3 are approximately equal.
- 1 5. The method of claim 3, wherein the signals $s_1(a)$ and s_3 are amplified an equal amount.
- 1 6. The method of claim 1 comprising the additional steps of:
2 transmitting the signal $s_1(a)$ over a first antenna belonging to a pair of diversity
3 antennas; and
4 transmitting the signal s_3 over a second antenna belonging to the pair of diversity
5 antennas.
- 1 7. The method of claim 1 comprising the additional steps of:
2 processing a signal S using space time spreading techniques to produce the
3 signals s_1 and s_2 .
- 1 8. The method of claim 1, wherein the signal s_1 comprises a non-STs/OTD signal.

- 1 9. The method of claim 1 comprising the additional steps of:
1 phase sweeping the signal $s_1(a)$ using a second phase sweep frequency signal to
2 produce a phase swept signal $s_1(a)$ with a different phase from the phase swept signal
3 $s_1(b)$.
- 1 10. A method of signal transmission comprising the steps of:
2 splitting a signal s_1 into signals $s_1(a)$ and $s_1(b)$, wherein signal s_1 comprises a first
3 STS/OTD signal belonging to an STS/OTD pair;
4 phase sweeping the signal $s_1(a)$ using a first phase sweep frequency signal to
5 produce a phase swept signal $s_1(a)$; and
6 adding the signal $s_1(b)$ to a signal s_2 to produce a summed signal s_3 , wherein the
7 signal s_2 comprises a second STS/OTD signal belonging to the STS/OTD pair.
- 1 11. The method of claim 10, wherein the signal s_1 is split unevenly such that the signal $s_1(a)$
2 has an associated power level greater than a power level associated with the signal $s_1(b)$.
- 1 12. The method of claim 10 comprising the additional steps of:
2 amplifying the phase swept signal $s_1(a)$ to produce an amplified phase swept
3 signal $s_1(a)$; and
4 amplifying the signal s_3 to produce an amplified signal s_3 .
- 1 13. The method of claim 12, wherein power levels associated with the amplified phase swept
2 signal $s_1(a)$ and the amplified signal s_3 are approximately equal.
- 1 14. The method of claim 12, wherein the phase swept signal $s_1(a)$ and the signal s_3 are
2 amplified an equal amount.
- 1 15. The method of claim 10 comprising the additional steps of:
2 transmitting the phase swept signal $s_1(a)$ over a first antenna belonging to a pair
3 of diversity antennas; and
4 transmitting the signal s_3 over a second antenna belonging to the pair of diversity
5 antennas.
- 1 16. The method of claim 10 comprising the additional steps of:

processing a signal S using space time spreading techniques to produce the signals s_1 and s_2 .

17. The method of claim 10, wherein the signal s_1 comprises a non-STS/OTD signal.

18. The method of claim 10 comprising the additional steps of:
phase sweeping the signal $s_1(b)$ using a second phase sweep frequency signal to produce a phase swept signal $s_1(b)$ with a different phase from the phase swept signal $s_1(a)$.

19. A base station comprising:

a splitter for splitting a signal s_1 into signals $s_1(a)$ and $s_1(b)$, wherein signal s_1 comprises a first STS/OTD signal belonging to an STSOTD pair;
a multiplier for phase sweeping the signal $s_1(b)$ using a first phase sweep frequency signal to produce a phase swept signal $s_1(b)$; and
an adder for adding the phase swept signal $s_1(b)$ to a signal s_2 to produce a summed signal s_3 , wherein the signal s_2 comprises a second STS/OTD signal belonging to the STS/OTD pair.

20. The base station of claim 19, wherein the splitter unevenly splits the signal s_1 such that the signal $s_1(a)$ has an associated power level greater than a power level associated with the signal $s_1(b)$.

21. The base station of claim 19 further comprising:

a first amplifier for amplifying the signal $s_1(a)$ to produce an amplified signal $s_1(a)$; and
a second amplifier for amplifying the signal s_3 to produce an amplified signal s_3 .

22. The base station of claim 21, wherein the first and second amplifiers amplify the signals $s_1(a)$ and s_3 such that power levels associated with the amplified signals $s_1(a)$ and s_3 are approximately equal.

23. The base station of claim 21, wherein the first and second amplifiers amplify the signals $s_1(a)$ and s_3 an equal amount.

1 24. The base station of claim 19 further comprising:

- 2 a pair of diversity antennas having a first and a second antenna;
3 a first transmitter for transmitting the signal $s_1(a)$ over the first antenna; and
4 a second transmitter for transmitting the signal s_3 over the second antenna.

1 25. The base station of claim 19 further comprising:

- 2 a processor for processing a signal S using STS/OTD techniques to produce the
3 signals s_1 and s_2 .

1 26. The base station of claim 19, wherein the signal s_1 comprises a non-STS/OTD signal.

1 27. The base station of claim 19 further comprising:

- 1 a multiplier for phase sweeping the signal $s_1(a)$ using a second phase sweep
2 frequency signal to produce a phase swept signal $s_1(a)$ with a different phase from the
3 phase swept signal $s_1(b)$.

1 28. A base station comprising:

- 2 a splitter for splitting a signal s_1 into signals $s_1(a)$ and $s_1(b)$, wherein signal s_1
3 comprises a first STS/OTD signal belonging to an STS/OTD pair;
4 a multiplier for phase sweeping the signal $s_1(a)$ using a first phase sweep
5 frequency signal to produce a phase swept signal $s_1(a)$; and
6 an adder for adding the signal $s_1(b)$ to a signal s_2 to produce a summed signal s_3 ,
7 wherein the signal s_2 comprises a second STS/OTD signal belonging to the STS/OTD
8 pair.

1 29. The base station of claim 28, wherein the splitter unevenly splits the signal s_1 such that
2 the signal $s_1(a)$ has an associated power level greater than a power level associated with
3 the signal $s_1(b)$.

1 30. The base station of claim 28 further comprising:

- 2 a first amplifier for amplifying the phase swept signal $s_1(a)$ to produce an
3 amplified phase swept signal $s_1(a)$; and
4 a second amplifier for amplifying the signal s_3 to produce an amplified signal s_3 .

1 31. The base station of claim 30, wherein the first and second amplifiers amplify the signals
2 $s_1(a)$ and s_3 such that power levels associated with the amplified phase swept signal $s_1(a)$
3 and amplified signal s_3 are approximately equal.

1 32. The base station of claim 30, wherein the first and second amplifiers amplify the signals
2 $s_1(a)$ and s_3 an equal amount.

1 33. The base station of claim 28 further comprising:
2 a pair of diversity antennas having a first and a second antenna;
3 a first transmitter for transmitting the phase swept signal $s_1(a)$ over the first
4 antenna; and
5 a second transmitter for transmitting the signal s_3 over the second antenna.

1 34. The base station of claim 28 further comprising:
2 a processor for processing a signal S using space time spreading techniques to
3 produce the signals s_1 and s_2 .

1 35. The base station of claim 28, wherein the signal s_1 comprises a non-STS/OTD signal.

1 36. The base station of claim 28 further comprising:
1 a multiplier for phase sweeping the signal $s_1(b)$ using a second phase sweep
2 frequency signal to produce a phase swept signal $s_1(b)$ with a different phase from the
3 phase swept signal $s_1(a)$.